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THE GENUS DILATRIS BERG.

WITH THE DESCRIPTION OF A NEW SPECIES.

By W. F. BARKER.

(With Plates XVI and XVII.)

Several years ago while making an examination of two mauve-flowered specimens of *Dilatris* collected on the Cape Peninsula, Mr. N. S. Pillans pointed out certain differences between them which seemed to indicate that they were specifically distinct. This stimulated my interest in the genus, for Baker includes *D. corymbosa* Berg. as the only species with mauve flowers in his "Flora Capensis." On making further examinations of numerous herbarium collections, I found yet a third species was included in them under that name. It was found too that one of these plants had been previously described, and that there exists what seems to be a good description of a fourth species. With so much confusion it seemed advisable to undertake a revision of the genus at the earliest possible date. Unfortunately owing to War conditions Thunberg's specimens at the Linnean Herbarium have not been available for examination and on enquiry at Uppsala it was found that all the specimens of the genus were missing from the collection and could not be traced. However, sufficient data have been accumulated to produce the following account which will bridge the gap until all the material can become available.

HISTORY OF THE GENUS.

The earliest record of the genus *Dilatris* is to be found in "Bergius Flora Capensis," p. 9, t. 3, fig. 5 (1767). Here he includes a figure of an inflorescence without basal leaves. I have not been able to trace the specimen from which the plate was made, but apparently it was incom-

plete as the basal leaves are not mentioned in the description. From the data available it is possible to decide that his plant was the very hirsute, large-flowered plant which occurs on the Cape Peninsula.

In 1767 shortly after Bergius had published his account of the genus Linnaeus published a description in his "Mantissa Plantarum Prima" under the name of *Ixia hirsuta* which agrees with Bergius' description of *D. corymbosa* and in 1771 in his "Mantissa Plantarum Altera" he quotes Berg. Cap. 9, t. 3, f. 5 as being synonymous with his specimen, but there is a slight discrepancy as he describes the anthers as being equal. Unfortunately the specimen has been inaccessible and it was not possible to check this statement and for the time being it must therefore be presumed that the two species are synonymous.

A year later Burmann described *Ixia umbellata* in his "Prod. Cap." p. 2. This description except for a few minor changes agrees in actual wording with that of *Ixia hirsuta* Linn. and it therefore appears that Burmann was describing the same plant under a new specific name.

Linnaeus transferred the plant in 1774 in his "Syst. Veg. ed. 13" to the genus *Wachendorfia* calling it *W. umbellata* and in 1781 Linn. f. transferred it once more calling it *Dilatris umbellata*. He also described two additional species: *D. viscosa*, a very distinct plant with the whole inflorescence covered with viscid glandular hairs and with dull orange linear-lanceolate perianth-segments, and *D. paniculata*, based on a plant collected by Thunberg at Saldanha Bay, the description of which has not been matched with any more recently collected plant. Juel in his "Plantae Thunbergianae" cites Linn. f.'s type specimen of *D. paniculata* as being in the Herbarium at Uppsala, but on making enquiries recently it was found to be missing from the collection and cannot be traced, therefore it is best to consider it for the present as a little known species.

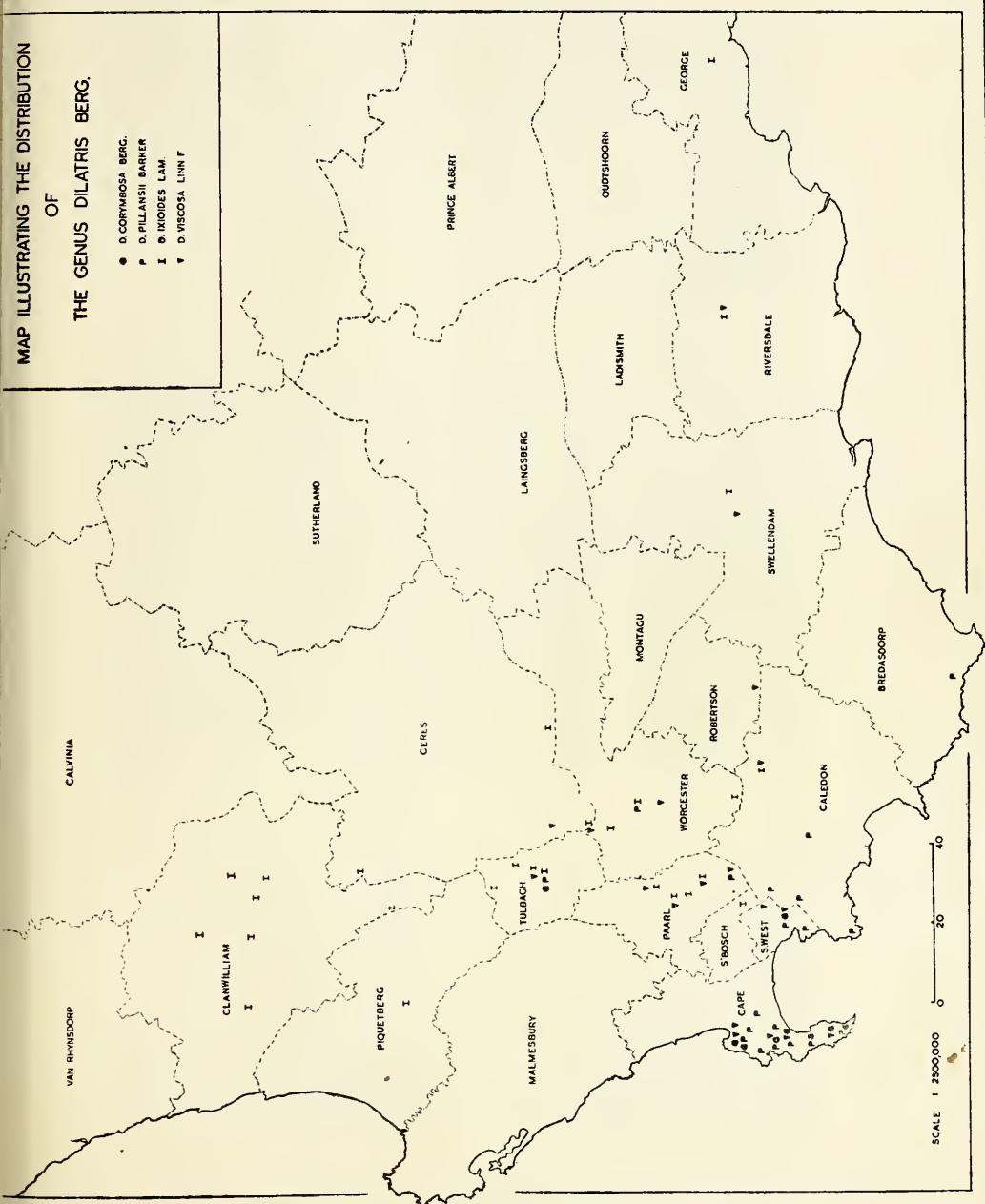
Lamarck in his Encycl. 2, p. 281 (1786) recognised five species, adding two new ones to those of Linn. f. The type specimen of *D. ixiooides* Lam. is preserved in the Paris Herbarium and was examined in 1939 by Professor R. H. Compton. It was found to agree with a plant which occurs abundantly on some mountain slopes on the mainland. It is easily distinguished by its long exserted stamens, a character in which it differs from all the other mauve-flowered species. As this is the earliest description of the plant it must be accepted as the correct name for the species (assuming that it is not identical with *D. paniculata*, see p. 160) Lamarck's fifth species, *D. hexandra*, has since been transferred to the genus *Lanaria*.

Thunberg in his "Prod. p. 10" (1794) and Willd. in the Sp. Pl. 1 p. 247 (1798), both list the three earliest species only but give the type plant its correct specific name.

MAP ILLUSTRATING THE DISTRIBUTION

OF
THE GENUS DILATRIS BERG.

- *D. CORNIFERA* BERG.
- *D. PILLANSII* BARKER
- *D. IODIDES* LAM.
- ▼ *D. VIScosa* LINN F.



In 1805 Persoon in his "Syn. Pl. 1, p. 54," came nearest to the present conception of the genus. For with the exception of *D. Heritiera* which is now included in the genus *Lanaria*, he recognised four species *D. corymbosa* Berg., *D. ixiooides* Lam., *D. viscosa* L.f. and *D. paniculata* L.f. His excellent work was completely overlooked both by Vahl in "Enum. 11, p. 161" (1806) and by Baker in his "Flora Cap. Vol. VI (1896-97).

No description has been found to correspond with the third of the mauve-flowered species formerly included in *D. corymbosa* Berg. I therefore propose to call it *D. Pillansii*.

DISTRIBUTION.

The genus *Dilatris* is endemic to South Africa and occurs on the mountain ranges of the South Western Cape. The biggest number of species is concentrated in the extreme South-Western corner, the three species *D. corymbosa*, *D. Pillansii* and *D. viscosa* occurring in the Cape Peninsula. Of these *D. corymbosa* seems to be confined almost exclusively to the Peninsula as the only two records of its discovery outside are somewhat doubtful. On the other hand *D. ixiooides*, the fourth and most widely distributed of all the species, is not definitely known to occur on the Peninsula, but extends from Nieuwoudtville in the North-Western, to Stellenbosch in the South-West and eastwards as far as George.

D. viscosa, the only dull-orange flowered species, is found on plateaux in marshy ground and on slopes high up which catch the South-East cloud. The other species usually favour steep well-drained slopes, occasional plants occurring on the flats below.

FEATURES OF THE GENUS.

All the species of *Dilatris* are perennial, having a reddish woody root-stock and very short closely-set branches covered with distichous glabrous linear to linear-oblong leaves, forming tufts. The peduncle which is pubescent is usually raised well above the leaves and has a few amplexicaul lanceolate bracts. The branches of the inflorescence are short, usually bifid and more or less equal in length. In some species they are arranged at intervals in the upper third of the peduncle forming a panicle as in *D. viscosa* and *D. ixiooides* (Plate XVII, Figs. 5-8); in others the branches arise from the extreme summit of the peduncle forming a pseudo-umbel as in *D. corymbosa* and *D. Pillansii*. (Plate XVI, Figs. 1-4.)

The flowers are arranged on the branches in a helicoid manner as in the Boraginaceae, the lowest one maturing first and the branches straightening out as the successive flowers open. The final stage is well illustrated in Plate XVI, Fig. 2. The size of the flowers varies somewhat in each species but specific characters such as the relative length of the filaments and size of the anthers are constant. The perianth-segments are sub-equal, the outer being slightly narrower and more hairy.

In all the specimens which I have examined I have found two stamens with longer filaments and smaller anthers than the third, but there seems to have been a difference of opinion on this point among the various workers on the genus. Dr. R. Marloth in "The Flora of South Africa," Vol. IV, p. 109, describes the two anthers as being larger than the third, but this appears to be an error as in his illustration on Plate 30 of the plant now known as *D. Pillansii* the one large and two small anthers are clearly shown. Smith in his "Exotic Botany" I, p. 29, says: "The name *Dilatris*, given by Bergius from διτις and λατροις expressive of two servants or attendants, seems to imply that two of the stamens are imperfect or of less importance than the third, probably because he found the latter had a larger anther but we find all three perfect." This statement by Smith is borne out by the illustration he produces of a plant which appears to be an abnormal form of *D. ixoides* and this may explain the unusual character of the stamens. Linnaeus too describes *D. hirsuta* as having equal stamens but if it is synonymous with *D. corymbosa* this is not so, as Bergius describes the third stamen of his plant as having a shorter filament and larger anther than the rest.

The style in *Dilatris* is slender and eventually becomes as long as or a little longer than the stamens. The stigma is minute. The ovary is three chambered and the ovules solitary in each cell, the placentation being axile. The seeds are oblong and flat as in *D. viscosa* or round with concave upper and convex lower surfaces.

The seed dispersal is effected in two distinct ways. In *D. viscosa* where the perianth-segments are narrow, although they persist, they are of no further use to the plant. The capsule opens from the apex down the junction of the carpels to about half-way and the outer carpel walls spread apart leaving the central column free at the apex. It is usual for the single ovule in each cell to mature, the seeds which are oblong and flat become detached and are apparently shaken out of the capsule which remains erect. (See Fig. 4, nos. 10—16.)

In the species with broad perianth-segments they become papery and aid in the dispersal of the seeds by acting as a parachute. It is usual for one carpel only to develop, the rest becoming abortive, but occasionally two or even three have been found to mature. The ovule which

is round or oblong enlarges so as to fill the entire cavity of the carpel and is clasped by a flange which projects inwards round the entire edge of each carpel. The carpel-wall containing the ripe seed thus held in place by the flange begins to separate from the receptacle, starting at the base and continuing upwards, until it finally breaks away completely with the perianth attached to the apex, thus forming a mechanism suitable for dispersal by wind. (See Fig. 2, nos. 11—16.) If two or three carpels develop they all remain attached to the perianth and are dispersed at the same time.

Dilatris viscosa with its distinct method of seed dispersal, its dull-orange lanceolate perianth-segments and the reddish viscid-glandular pubescence on its inflorescence, differs to such a marked degree from the other well-known species, that it might be considered worthy of generic rank. But it is not possible to separate the species satisfactorily for two reasons. Firstly, because the little-known *D. paniculata* described as having an inflorescence covered with viscid-glandular hairs and as having mauve lanceolate perianth-segments appears to be the connecting link between the two sections and, secondly, because the stamens show a common character which is peculiar to the genus.

DESCRIPTION OF THE GENUS.

Perennials with a reddish woody root-stock and rigid distichous basal leaves. *Peduncle* elongate, with a few reduced cauline leaves. *Flowers* numerous, arranged in a racemose, corymbose or pseudo-umbellate panicle. *Perianth* cut down to the ovary; segments 6, subequal, persistent. *Stamens* three, unequal, one shorter than the rest with a larger anther differing in colour; all versatile; dehiscence longitudinal; filaments filiform, attached to the base of the inner segments. *Ovary* globose, inferior, 3 celled, ovules solitary in each cell; style filiform, stigma minute. *Capsule* septicidal or septifragal. *Seeds* discoid, flat or convex below and concave above.

KEY TO THE SPECIES.

- A. Inflorescence viscid. Flowers dull orange- or mauve-yellow. Capsule septicidal, dehiscing from above; seeds free or capsule unknown.
- B. Flowers dull orange, perianth segments linear-lanceolate, stamens exerted, capsule septicidal, seeds free 5. *viscosa*.
- BB. Flowers mauve-yellow, perianth-segments lanceolate, stamens half as long as perianth. Capsule unknown.. 4. *paniculata*

AA. Inflorescence not viscid. Flowers mauve. Capsule septifragal dehiscing from below; seeds enclosed in wall of carpel and attached to persistent perianth.

C. Stamens included or just manifest.

D. Perianth-segments ovate-lanceolate sub-acute; longest stamens equalling perianth, third anther much the largest 1. *corymbosa*.

DD. Perianth segments oblong-ovate obtuse, stamens much shorter than perianth; third anther only slightly larger than others 2. *Pillansii*.

CC. Stamens well exserted, third anther very large 3. *ixioides*.

DESCRIPTION OF SPECIES.

1. *Dilatris corymbosa* Berg. *Basal leaves linear-oblong, up to 30 cm. long and 5—6 mm. broad. Inflorescence hirsute, with the branches all more or less the same length and arising from the top of the peduncle forming a pseudo-umbel. Perianth-segments mauve, ovate-lanceolate, sub-acute, up to 13 mm. long and 6 mm. broad, very hirsute on the outside, erect near the base, spreading and convex on the lower side in the upper two-thirds, with a few large dark glands at the extreme apex. The two long stamens about equal to the perianth-segments, anthers small, the third stamen a little shorter, with the anther twice as long and wide as the others. Ovary globose, very hirsute. Style finally about as long as the longest stamens. Capsule septifragal, 4·1 mm. diam. Seeds round, 4 mm. diam.*

Dilatris corymbosa Berg. Cap. 9, t. 3, fig. 5 (Sept. 1767); *Ixia hirsuta* L. Mant. Prima p. 27 (Nov. 1767); *Ixia umbellata* Burm. Prod. Cap. p. 2 (1768); *Ixia hirsuta* L. Mant. Altera p. 320 (1771); Linn. Mant. Pl. Altera p. 511 (1771); *Wachendorfia umbellata* L.f. Syst. Veg. ed. 13 p. 80 (1774); *Dilatris umbellata* L.f. Suppl. Pl. (1781); Linn. Syst. Veg. ed. 14 p. 93 (1784); Lam. Encycl. 2 p. 281 (1786); Lam. III. p. 126 (1791); *Dilatris corymbosa* Thunb. Prod. 10 (1794); *Dilatris umbellata* L. Syst. Veg. ed. 15 p. 95 (1797); *Dilatris corymbosa* Willd. Sp. Pl. p. 247 (1798); Persoon Syn. Pl. I p. 54 (1805); *Dilatris umbellata* Vahl. Enum. II p. 161 (1806) excluding *D. ixioides*; Linn. Syst. Veg. ed. 15 Roem et Schultes p. 483 (1817) excluding *D. ixioides*; *D. corymbosa* Thunb. Flor. Cap. ed. I. p. 257 (1818); ed. II p. 66 (1823); Baker in Flora Cap. Vol. VI p. 3 (1896-97), excluding references to Smith's Exotic Bot. 1.29 t. 16 and Lam. III. Gen. 127.

Habitat. Plateaux and mountain slopes and occasionally on flats.

Flowering season. August to January.

Distribution. Cape Province. CAPE PENINSULA: Table Mtn., *H. Bolus* (AM.)! Camps Bay, *Pappe* (Kew)! *Prior* (Kew & NHP.)! *Marloth*

361¹ (NHP.)! Flats near Constantia, Jameson (Kew)! South slopes of Constantiaberg, Salter 7596b (NBG.)! Muizenberg, Guthrie 1441 (GH.)! Muizenberg Plateau, Kensit (GH.)! Pillans 3702 (PH.)! Muizenberg Mtn. near Kalk Bay, Bolus 3314 (BH.)! Simonstown, Ryder 151 (Kew)! Near Naval Station Klaver Valley, Salter 7831a (NBG.)! Klaver Valley,

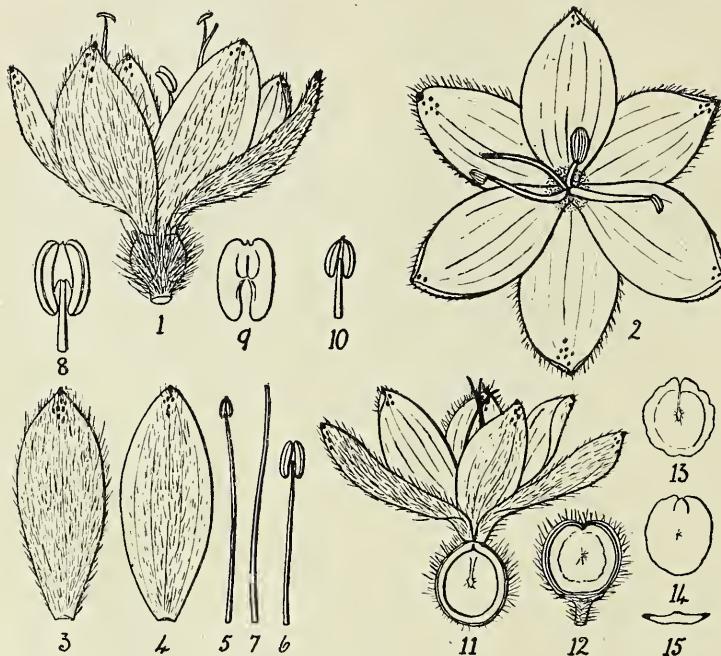


FIG. 1. *Dilatris corymbosa*, Berg. 1. Flower, side view $\times 2\frac{1}{2}$. 2. Flower, front view $\times 2\frac{1}{2}$. 3. Outer perianth-segment, outer view $\times 2\frac{1}{2}$. 4. Inner perianth-segment, outer view $\times 2\frac{1}{2}$. 5. Long stamen $\times 2\frac{1}{2}$. 6. Short stamen $\times 2\frac{1}{2}$. 7. Style $\times 2\frac{1}{2}$. 8. Anther of short stamen, front view $\times 5$. 9. Anther of short stamen, back view $\times 5$. 10. Anther of long stamen $\times 5$. 11. Old perianth with carpel attached containing the seed $\times 2\frac{1}{2}$. 12. Receptacle from which carpel has become detached $\times 2\frac{1}{2}$. 13. Inner view of unripe seed $\times 2\frac{1}{2}$. 14. Outer view of unripe seed $\times 2\frac{1}{2}$. 15. Transverse section of unripe seed $\times 2\frac{1}{2}$. (Salter 7831a.) Del. W. F. Barker.

Salter 7948b (NBG.)! Klaver Vley, Wolley Dod 1979 (Kew)! Plains South-West of Smitswinkel Bay, Pillans (PH.)! North-West of Pauls

¹ 361 Marloth has duplicated this number for a specimen of *D. ixoides* Lam. (NHP.).

Berg, *Pillans* 4589 (PH.)! Somerset West : Sir Lowry's Pass, *MacOwan* 1961² (SAM., AM., Kew, & BM.)! TULBAGH : Nieuwekloof, *MacOwan* 3041³ (NHP.)! WITHOUT LOCALITY : *Zeyher* (BH. 22580)! *Zeyher* (SAM. 25158)! Prom. B. Spei, *Masson*⁴ (BM.)!

2. *Dilatris Pillansii*, Barker, sp.n.;

Folia basalia long. ad 30 cm., lat. 3·5 mm. *Inflorescentia* pseudo-umbellata. *Perianthii segmenta* lilacina, pubescentia, subaequalia ovata, obtusa, basi deflexa, long. ad 10 mm., lat. 6 mm. *Filamenta* quam perianthium distincte breviora, tertium altera longitudine dimidium, anthera parum grandiore.

Basal leaves linear, up to 30 cm. long and 3—5 mm. broad, usually narrow. *Inflorescence* pubescent, with the branches all more or less the same length and arising from the top of the peduncle forming a pseudo-umbel. *Perianth-segments* mauve, ovate, obtuse, up to 10 mm. long and 6 mm. broad, pubescent on the outside, deflexed at the base, deeply convex on the lower side, suberect with small scattered black glands at the apex. The two long *stamens* distinctly shorter than the perianth, *anthers* small; the third *stamen* about half as long as the rest with its *anther* 1½ times as long and wide as those of the others. *Ovary* depressed, globose, pubescent. *Style* finally as long as the longest stamens. *Capsule* septifragal, about ·5 cm. diam. *Seeds* round ·4 cm. diam., convex outside concave inside.

Illustrated in Marloth's "Flora of S. Afr.," Vol. IV t.31 (1915), in "A Second Book of South African Flowers," by Barclay, Bolus & Steer, p. 131 and in Nature Notes No. 58 under the name of *D. corymbosa* Berg.

Habitat. Mountain slopes, plateaux and occasionally on flats.

Flowering season. August—January.

Distribution. Cape Province. CAPE PENINSULA : Camps Bay, *Burchell* 323 (Kew)! Kenilworth, *H. Bolus* 7288 (BH.)! Kenilworth Race Course, *N. S. Pillans* (PH.)! Near Skoorsteenberg, *Salter* 7956a (N.B.G.)! Steenberg Plateau, *Salter* 7938 (N.B.G.)! Constantiaberg, *Salter* (N.B.G.)! Retreat, Mrs. Burton's garden, *Pole-Evans* (N.H.P. 11844)! Common on the Plateau of the Muizenberg, *Pillans* 3701 (*type* in BH.)! Plateau near Muizenberg, *Moss* 5606 (BM.)! Simonsberg,

² 1961. There is a mixed gathering on the Kew sheet of this number; the specimen without a number is *D. Pillansii* Barker.

³ 3041. This number has been duplicated. A sheet in the S.A. Museum 25156 is *D. Pillansii* Barker.

⁴ There are two Masson sheets in the British Museum, the one marked Prom. B. Spei is a mixed sheet with *D. corymbosa* Berg. and *D. Pillansii* Barker, the other marked Prom. C. Spei is *D. ixoides* Lam.

Salter 327/18 (BM.)! Jameson (Kew)! Simonsbay, Wright (Kew), McGillivray 472 & 176 (Kew)! Klaver Vley, Wolley Dod 1979 (BM.)! Klaver Valley near sanatorium, Salter 7832 (BH.)! Salter 7831 & 7948a (N.B.G.)! Patreis Vlei, Salter 7880 (N.B.G.)! Modderdam West of Klaas-jagersberg, Salter 7902 (N.B.G. & BH.)! Lewis (SAM. 53728)! Near Wolvekop, Salter 7900 (BH. & N.B.G.)! Smitswinkel, Compton 8107 (N.B.G.)! Uncommon on low hills North-West of Paulsberg, N. S. Pillans (PH.)! Frequent on dry slopes South base of Paulsberg, N. S. Pillans (PH.)!

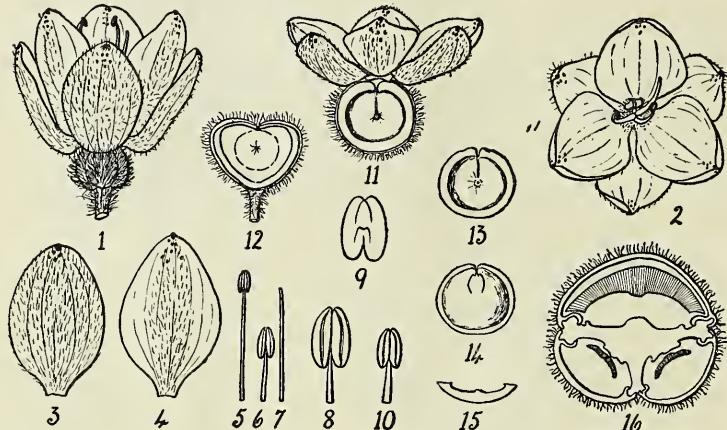


FIG. 2. *Dilatris Pillansii*, Barker. 1. Flower, side view $\times 2\frac{1}{2}$. 2. Flower, front view $\times 2\frac{1}{2}$. 3. Outer perianth-segment, outer view $\times 2\frac{1}{2}$. 4. Inner perianth-segment, outer view $\times 2\frac{1}{2}$. 5. Long stamen $\times 2\frac{1}{2}$. 6. Short stamen $\times 2\frac{1}{2}$. 7. Style $\times 2\frac{1}{2}$. 8. Anther of short stamen, front view $\times 5$. 9. Anther of short stamen, back view $\times 5$. 10. Anther of long stamen, front view $\times 5$. 11. Old perianth with carpel attached containing the seed $\times 2\frac{1}{2}$. 12. Receptacle from which carpel has become detached $\times 2\frac{1}{2}$. 13. Inner view of ripe seed $\times 2\frac{1}{2}$. 14. Outer view of ripe seed $\times 2\frac{1}{2}$. 15. Transverse section of ripe seed $\times 2\frac{1}{2}$. 16. Transverse section through capsule $\times 10$. (Compton 8107 and Salter.) Del. W. F. Barker.

(PH.)! Flats West of Paulsberg, Salter 4161 (Kew)! Salter 8289 (N.B.G.)! Cape Flats, Guthrie 1286 (G.H.)! Pappe (Kew)! Cape plains and South-East Coast, Bowie (BM.)! TULBAGH: Nieuweloof Mtns., MacOwan 3041⁵ (SAM. 25156)! WORCESTER: (AM.)! PAARL: French Hoek, Phillips (SAM. 8498)! SOMERSET WEST: Near Grietjiesgat at foot of Hottentots Holland, H. Bolus (BH.)! Hottentots Holland (BH.)!

⁵ 3041. This number has been duplicated. A sheet in the Nat. Herb. Pretoria is *D. corymbosa* Berg.

Sir Lowry's Pass, *H. Bolus* (AM. & BH.)! *MacOwan* 1961⁶ (SAM. 6417 & Kew)! CALEDON: Viljoens Pass, *Rogers* 28989 (AM. & Kew)! *Salter* 4029 (Kew)! Mountains South of Gordons Bay, *Marloth* 10, 004 (NHP.)! Hangklip, N. S. *Pillans* 8507 (BH.)! Palmiet River, *Cohen* (NGB.)! Grabouw, N. S. *Pillans* 4798 (Kew & BH.)! Haasvlakte Forest Reserve, Houw Hoek Mtn., *Hubbard* 178 (BH.)! *Galpin* 4639 (NHP.)! *Zeyher* 4097 (SAM. 25159)! Houw Hoek Forest Reserve, *Forest Officer Tokai* (BH.)! BREDASDORP: Bredasdorp Flower Show, *P. Barnes*! Bredasdorp, *Galpin* 11322 (Kew & NHP.)! Brandfontein South slope of Zoetansberg near Wolvekop, *Smith* 4985 (NHP.)! Potteberg, *Pillans* 9329 (BH.)! No LOCALITY: C.B.S., *Thom* 772 & 948 (Kew)! *Wallich* (BM. & Kew)! Herb *Harvey* 863⁷ (Kew & BM.)! "Cape," *Drege*⁸ (Kew)! Prom. B. Spei. *Masson*⁹ (BM.)! 429 (Kew)! Cape (Kew)! Flats, *Wallich* 150 (BM.)! *Lehmann* (BM.)! *Runicky* (BM.)! Bet. Cape Town and George *Rogers* (BM.)!

D. Pillansii Barker and *D. corymbosa* Berg. both occur on the Cape Peninsula and resemble one another in the colour of the flowers and general habit, but on closer examination they can easily be distinguished. The latter is a more robust plant with broader leaves, more hirsute inflorescence with larger flowers with narrower less concave segments, and longer stamens. (See Plate XVI, Figs. 1 and 2.) It is an interesting fact that although it is the type species of the genus it appears to be less common than the hitherto undescribed *D. Pillansii* and has been less frequently collected. This is probably due to the fact that it is not so widely distributed, being confined almost entirely to the Peninsula while *D. Pillansii* occurs both on the Peninsula and on the mainland as far off as Tulbagh, Worcester and Bredasdorp.

3. *Dilatris ixoides*, Lam. *Basal leaves* linear, up to 30 cm. long but usually shorter, and up to 4 mm. broad but usually about 2 mm. broad. *Inflorescence* pubescent, with the branches all more or less the same length, usually arranged at intervals in the upper third of the peduncle forming a racemose panicle, though occasionally the branches are congested

⁶ 1961. There is a mixed gathering on the Kew sheet of this number, the specimen marked 1961 is *D. corymbosa* Berg., the one without a number is *D. Pillansii* Barker.

⁷ 863. There is a mixed gathering on the sheet of this number at Kew. The right-hand specimen is *D. ixoides* Lam., the one on the left-hand is *D. Pillansii* Barker.

⁸ There is a mixed gathering on the Drege sheet at Kew. The specimen marked "Cape" is *D. Pillansii* Barker, the other is *D. ixoides* Lam.

⁹ There are two Masson sheets in the British Museum, the one marked Prom. B. Spei. is a mixed sheet with *D. corymbosa* Berg. and *D. Pillansii* Barker, the other marked Prom. C. Spei. is *D. ixoides* Lam.

at the top of the peduncle forming a corymbose panicle. *Perianth-segments* pale mauve, ovate, sparsely pubescent; 7—10 mm. long with two or three black glands at the apex; the outer 4 mm. broad usually narrower, more acute and more pubescent than the inner. *Stamens* distinctly exserted, the two long ones up to 16 mm. long, anthers small; the third stamen half as long as the rest with a large arcuate anther 4 mm. long. *Ovary* globose pubescent. *Style* finally as long as the stamens. *Capsule* septifragal, about 5 mm. diam. *Seeds* round, 4·5 mm. diam.

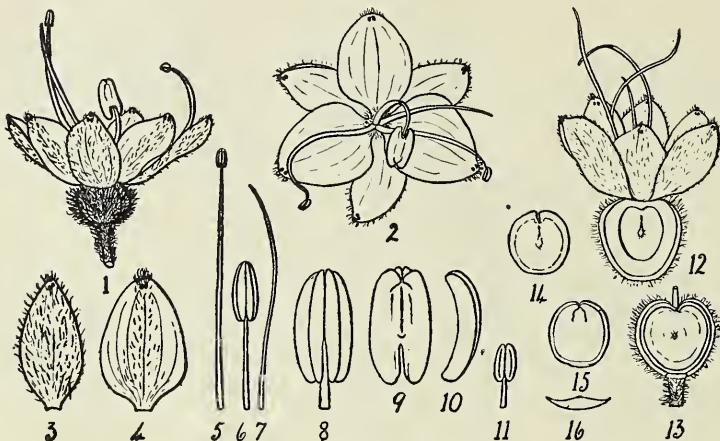


FIG. 3. *Dilatris ixiooides*, Lam. 1. Flower, side view $\times 2\frac{1}{2}$. 2. Flower, front view $\times 2\frac{1}{2}$. 3. Outer perianth-segment, outer view $\times 2\frac{1}{2}$. 4. Inner perianth-segment outer view $\times 2\frac{1}{2}$. 5. Long stamen $\times 2\frac{1}{2}$. 6. Short stamen $\times 2\frac{1}{2}$. 7. Style $\times 2\frac{1}{2}$. 8. Anther of short stamen, front view $\times 5$. 9. Anther of short stamen, back view $\times 5$. 10. Anther of short stamen, side view $\times 5$. 11. Anther of long stamen, front view $\times 5$. 12. Old perianth with carpel attached containing seed $\times 2\frac{1}{2}$. 13. Receptacle from which carpel has been detached $\times 2\frac{1}{2}$. 14. Inner view of unripe seed $\times 2\frac{1}{2}$. 15. Outer view of unripe seed $\times 2\frac{1}{2}$. 16. Transverse section of unripe seed $\times 2\frac{1}{2}$. (Barker 481 and Compton 8392.) Del. W. F. Barker.

Dilatris ixiooides Lam. Encycl. 2 p. 281 (1786); Lam. Ill. p. 127 (1791); Persoon Syn. Pl. I p. 54 (1805); Vahl, Enum. II p. 161 (1806).

Habitat. Mountain slopes at high altitudes.

Flowering season. September—February.

Distribution. Cape Province. CALVINIA: Lokenburg near Nieuwoudtville Laurence N.B.G. 2272/29 (BH.)! CLANWILLIAM: Whupperthal, Thode A2090 (NHP. 18791 and Kew!) Pakhuis Pass, Compton 9618 (NBG.)! Middelberg, Compton 6429 (NBG.)! Bothasberg Thorne

(SAM. 52680)! Algeria, *Lewis* (BH. 22244)! *Salter* 7574 (N.B.G. & BM.)! *Levyns* 2261 (TUC.)! *Galpin* 10516 (Kew & N.H.P.)! Cedarbergen, *Pattison* 14469 (BH.)! *Stokoe* 11/39 (BH.)! Middle East slope of Grasruggens Mtn., *Pillans* 8677 (BH.)! Clanwilliam, *Mader* (AM.)! Hills between Witte Els Kloof and Lamberts Hoek Berg, *Pillans* 9066 (BH.)! PIQUETBERG: Piquetberg, *Pillans* 7507 (BH.)! TULBAGH: Tulbagh, *Grant* 5035 (BH., Kew & N.H.P.)! Nieuweloof, *Zeyher* 77 No. 5 (BH.)! Great Winterhoek, Sneeuwagt Valley, *Phillips* 1870 (SAM & without number in BM)! Kleinpoort, *Marloth* 361¹⁰ (N.H.P.) Witsenberg, *Andreae* 150 (N.H.P.)! Waterfall, *Ecklon* and *Zeyher* (N.H.P. 22385) CERES: Elands Kloof, *Levyns* 5129 (TUC.)! Mitchells Pass, *Guthrie* 2214 (N.B.G.)! Matroosberg near Laaken Vlei, *Phillips* 2062 (SAM. 11862)! Waaihoek, *Pells* (N.B.G.)! WORCESTER: Worcester, *Cooper* 1859 (BH.)! *Zeyher* (Kew.)! *Fine* G163 (N.H.P.)! Omklaarberg, Wildepaardeberg, *Stokoe* 1099 (N.H.P. & BH.)! *Marloth* 118 (N.H.P.)! Roodeberg, *Compton* 8392 (N.B.G.)! Bonteberg, *Compton* 9995 (N.B.G.)! PAARL: Bainskloof, *Grant* 2650 (N.H.P.)! *Barker* 480 & 481 (N.B.G.)! Wellington, *Thompson* (N.H.P.)! Du Toits Kloof, *Tyson* 892 (AM. & SAM.)! Weimershoek, *Salter* 5002 (BM., BH. & Kew)! STELBOSCH: Stellenbosch, *Miers* (BM.)! SOMERSET WEST: Cape of Good Hope, False Bay, *Robertson* (BM.)! CALEDON: Baviaans Kloof near Genadendal, *Burchell* 7865 (Kew)! SWELLENDAM: Tradouw Pass, *Adamson* (TUC.)! RIVERSDALE: Langeberg above Witte Els, *Muir* 1280 (N.H.P.)! GEORGE: Joubertsberg Plantation, *Taylor* 1646 (N.H.P.)! NO LOCALITY: *Lamarck* (type in Herb. Paris)! *Drege* 1840 (Kew)! *Drege*¹¹ (Kew)! *Harvey* 863¹² (Kew)! *Drege* (BM.)! *Oldenburg* No. 2 (BM.)! *Mackrell* No. 84 (BM.)! *Niven* (BM.)! Prom. C. Spei, *Masson*¹³ (BM.)!

There is no definite record that this species occurs on the Cape Peninsula. There is a specimen in the British Museum collected by Mr. Robertson, labelled "Cape of Good Hope, False Bay." I take this to be the Hottentots Holland side of False Bay as the plant is known to occur as far south as the Klein Drakenstein. Another interesting point about this specimen as well as one collected by Masson and another by

¹⁰ 361. Marloth has duplicated this number for a specimen of *D. corymbosa* Berg. in the Nat. Herb. Pretoria.

¹¹ There is a mixed gathering on the Drege sheet at Kew. The specimen marked "Cape" is *D. Pillansii* Barker, the other is *D. ixoides* Lam.

¹² 863. There is a mixed gathering on the sheet of this number at Kew. The right-hand specimen is *D. ixoides* Lam., the one on the left-hand is *D. Pillansii* Barker.

¹³ There are two Masson sheets in the British Museum, the one marked Prom. B. Spei. is a mixed sheet with *D. corymbosa* Berg. and *D. Pillansii* Barker, the other marked Prom. C. Spei. is *D. ixoides* Lam.

Miers from Stellenbosch is the fact that at one time they received the name *D. paniculata* Thunb. This is the specific name given by L.f. to a plant collected by Thunberg at Saldanha Bay and described as having stamens half as long as the segments. It is possible that a mistake was made in the description and that it should have read "perianth-segments half as long as the stamens." (See Fig. 3.) If this were so it would mean that *D. ixioides* Lam. which is known to occur on the Piquetberg not far from Saldanha Bay is identical with *D. paniculata* L.f. and as *D. paniculata* is the earlier name it would be the valid one. This point can only be cleared up by seeing the type specimen which is missing from Uppsala and in the meantime *D. ixioides* Lam. and *D. paniculata* L.f. will be kept as two distinct species.

4. *Dilatris paniculata*, L.f. Suppl. Plant. p. 101 (1781).

" Petalis lanceolatis, panicula oblonga villosa viscosa.

Habitat in Cap. bonae spei. Thunberg.

Flores purpureo-flavescentes."

Description: Translated from Thunb. Fl. Cap. p. 67 (1823).

" Growing in sand in the region of Saldanha Bay and Swartland.

Flowering in Oct. and following months.

Stem somewhat shrubby, simple, striate, erect, one foot high, the whole plant hirsute with dense, patent, reddish glandular viscid hairs. *Leaves* radical as in the former species (*D. viscosa*), a little shorter than the stem, seven inches or more; caudine alternate, few, amplexicaul, lanceolate acute, 1 inch or more. *Flowers* paniculate from the middle to the apex of the stem. *Bracts* similar to the leaves, lanceolate, as long as the peduncles. *Peduncles* alternate, bifid, erect, an inch long. *Pedicels* short, more or less 4-fld. *Petals* purplish-yellow, acute, concave, glabrous within, villous without, erecto-patent, unguiculate. *Filaments* purplish, half as long as corolla; the third shorter. *Anthers, seeds, stigma* as in the former species (*D. viscosa*). *Style* a little longer than the stamens, purplish. *Capsule* hirsute all over."

Dilatris paniculata, L.f. Suppl. Plant. p. 101 (1781); Act. Nat. Serut. Berol. p. 52 (1783); Linn. Syst. Veg. ed. 14 p. 93 (1784); Lam. Encycl. 2 p. 282 (1786); Thunb. Prod. 10 (1794); Linn. Syst. Veg. ed. 15 p. 95 (1797); Willd. Sp. Pl. p. 247 (1798); Persoon Syn. Pl. I. p. 54 (1805); Vahl. Enum. II p. 483 (1817) excluding *D. carolina* Lam.; Linn. Syst. Veg. ed. 15 Roem. et Schultes p. 483 (1817); Thunb. Fl. Cap. p. 66 (1823).

5. *Dilatris viscosa*, L.f. *Basal leaves* ensiform, up to 22 cm. long the widest up to 17 mm. broad. *Inflorescence* viscid, reddish glandular-

pubescent; peduncle well raised above the leaves with several caudine leaves some or all of which may be amplexicaul; branches all more or less the same length, arising near the top of the peduncle to form a sub-umbellate corymbose panicle, or they may be arranged for some distance

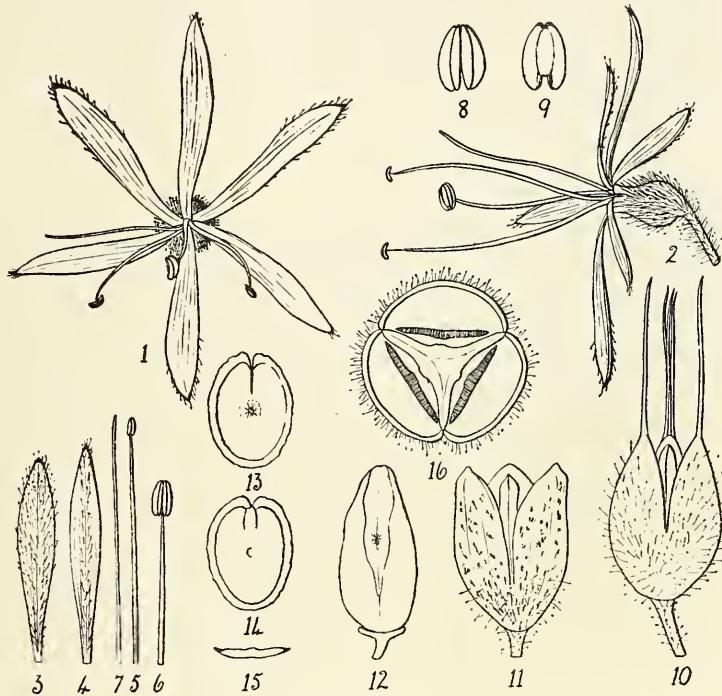


FIG. 4. *Dilatris viscosa*, L.f. 1. Flower, side view $\times 2\frac{1}{2}$. 2. Flower, side view $\times 2\frac{1}{2}$. 3. Outer perianth-segment, outer view $\times 2\frac{1}{2}$. 4. Inner perianth-segment, outer view $\times 2\frac{1}{2}$. 5. Long stamen $\times 2\frac{1}{2}$. 6. Short stamen $\times 2\frac{1}{2}$. 7. Style $\times 2\frac{1}{2}$. 8. Anther of short stamen, front view $\times 5$. 9. Anther of short stamen, back view $\times 5$. 10. Capsule beginning to dehiscere $\times 2\frac{1}{2}$. 11. Old capsule $\times 2\frac{1}{2}$. 12. Receptacle $\times 2\frac{1}{2}$. 13. Inner view of ripe seed $\times 2\frac{1}{2}$. 14. Outer view of ripe seed $\times 2\frac{1}{2}$. 15. Transverse section of ripe seed $\times 2\frac{1}{2}$. 16. Transverse section through young capsule $\times 5$. (Esterhuysen and Barker 690.) Del. W. F. Barker.

from the top to form a very lax racemose panicle. *Perianth-segments* linear-lanceolate, spreading dull orange 1—1.3 cm. long, 2.5 mm. broad, glandular-pubescent outside. *Stamens* usually the length of the perianth

or a little longer, the third stamen a little shorter than the rest with a larger anther 2 mm. long. *Style* finally as long as the stamens; ovary 3 mm. diam. *Capsule* septicidal, oblong 1 cm. long, becoming sub-glabrous when ripe. *Seeds* oblong, flat 7 mm. long and 5 mm. wide.

Dilatris viscosa, L.f. Suppl. P. 101 (1781); Linn. Syst. Veg. ed 14 p. 93 (1784); Lam. Ill. 1 tab. 34; Lam. Encycl. Method. (1791); Thunb. Prod. p. 67 (1794); Linn. Syst. Veg. ed. 15 p. 95 (1797); Willd. Sp. Pl. 1 p. 247 (1798); Persoon Syn. Pl. 1 p. 54 (1805); Vahl. Enum. II p. 161 (1806); Linn. Syst. Veg. ed. 15 Roem. et Schultes (1817); Thunb. Fl. Cap. p. 66 (1823); Fl. Cap. Vol. VI p. 3 (1896-97); Marloth's Flora of S. Afr. Vol. IV t. 31 (1915).

Habitat. Swampy places on high plateaux or mountain slopes which catch the South-East cloud.

Flowering season. August to December.

Distribution. Cape Province. CAPE PENINSULA: Table Mountain, *H. Bolus* 4604 (BM. & BH.)! *Pappe* (SAM. 22829)! *Jameson* (Kew)! *Marloth* 358 (NHP.)! *Rehmann* 586 (BM.)! *Harvey* (BM.)! First plateau Table Mtn., *Tredgold* (GH.)! Groene Kloof Table Mtn., *Galpin* 4637 (NHP.)! Summit of Table Mtn., *Pappe* (Kew)! *Milne* 183 (Kew)! *Bunbury* (BM.)! Casteel Berg, *Villette* (Kew)! Devils Peak, *Guthrie* 239 (GH.)! Constantiaberg, *Compton* 8272 (NBG.)! *Barker* 690 (NBG.)! *Wolley Dod* 2152 (BH & Kew)! *Salter* 327/5 (BM.)! Marshy ground upper end of Silver Mine Valley, *Pillans* 3060 (PH.)! Muizenberg, *MacOwan* 2507 (NHP.)! On ledges of damp cliff Gerbera Hill, *Pillans* (PH.)! Smitswinkel Bay, *Pillans* (PH.)! TULBAGH: Tulbagh Road Station, *Guthrie* 2389 (NBG.)! CERES: Ceres, *MacOwan* 3095 (SAM. 22828)! *H. Bolus* 8389 (BH.)! Ceres Show, *Compton* 4149 (BH.)! Waaihoek Mtns., *Barnard* 719 (SAM. 28156)! WORCESTER: Omklaarberg 20 miles South of Worcester, *Stokoe* 1135 (NHP.)! ROBERTSON: River Zonder Einde, *Zeyher* 4098 (SAM. 22830)! PAARL: Du Toits Kloof, *Pillans* 8488 (BH.)! Sneeuwkop Mtn., *Thorne* (SAM. 46475)! Mtns. South of Wemmershoek, *Andreae* 688 (NHP.)! French Hoek, *Phillips* 1299 (SAM.)! *Schlechter* 9312 (AM., Kew & BM.)! CALEDON: Hottentots Holland, *Stokoe* 218 (NHP.)! Landdrost Kop, *Thorne* (SAM. 51547)! Genadendal (BH.)! SWELLENDAM: Zuurbraak, *Galpin* 4638 (Kew & NHP.)! RIVERSDALE: Langeberg, *Muir* 6666 (SAM.)! *Muir* 183 (NHP.)! WITHOUT LOCALITY: *Drege* 1840/8459b (Kew)! *Burchell* 7071 (Kew)! *Burchell* 530 (Kew)! *Begley* (NHP.)! Prom. B.S., *Masson* (BM.)! *Mackrell* 46 (BM.)! Cape of Good Hope, *McGillivray* 473 (Kew)!

Table Mountain is the type locality for *D. viscosa* L.f. and the sub-umbellate corymbose panicle seems to be a constant feature of the

Peninsula specimens. Specimens collected on the mainland however show considerable variation in the shape of the inflorescence, the branches tending to separate from one another along the peduncle, forming a lax panicle and the caudine leaves becoming more slender and less amplexicaul. These characters are very marked in the plants found in the Ceres district (see Plate XVII, Fig. 8): when compared with the Peninsula form these appear to be almost specifically distinct, but owing to the existence of intermediate forms it is difficult to separate them satisfactorily even as varieties.

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During my investigation I received much help from various sources and have much pleasure in making the following acknowledgments. My thanks are due to Dr. L. Bolus for permission to use the Bolus Herbarium sheets for some of the accompanying photographs and also for the facilities provided at the Bolus Herbarium. To Sir Arthur Hill for the privilege of using the Herbarium and Library at Kew, to the directors of the herbaria at the British, Albany and South African Museums and the National Herbarium, Pretoria, the curator of the Guthrie Herbarium, and to Mr. N. S. Pillans for the use of their herbarium collections. Captain T. M. Salter has been most generous in supplying me with both living and dried material of his numerous collections and Professor R. H. Compton has rendered invaluable assistance in making examinations of material in European herbaria, in correcting this manuscript and in many other ways.

EXPLANATION OF SYMBOLS USED.

BH.	Bolus Herbarium.
GH.	Guthrie Herbarium.
PH.	Pillans Herbarium.
AM.	Albany Museum Herbarium.
BM.	British Museum Herbarium.
Kew.	Royal Botanic Gardens Herbarium, Kew.
NHP.	National Herbarium, Pretoria.
SAM.	South African Museum Herbarium.
TUC.	University of Cape Town Herbarium
NBG.	National Botanic Gardens Herbarium, Kirstenbosch.

PLATES.

PLATE XVI. *DILATRIS CORYMBOSA*, Berg.

FIG. 1. Plants showing the pseudo-umbellate inflorescence in the young stage. (Salter 7831a.)

FIG. 2. Plants showing old inflorescence in which the branches have straightened out. (Zeyher BH.22580.)

DILATRIS PILLANSII, Barker.

FIG. 3. Plants showing the pseudo-umbellate inflorescence in the young stage. (Pillans 3701 type in BH.)

FIG. 4. Plant showing old inflorescence in which branches have straightened out. (Compton 8107.)

PLATE XVII. *DILATRIS IXIOIDES*, Lam.

FIG. 5. Plants showing paniculate inflorescence in young stage. (Barker 481.)

FIG. 6. Plants showing old inflorescence in which the branches have straightened out. (Stokoe 1099.)

DILATRIS VISCOSA, L.f.

FIG. 7. Plants showing the young sub-umbellate panicle and the fruiting stage with the branches erect. (Bolus 4604.)

FIG. 8. Plants showing the form from the Ceres district with lax inflorescence and narrow cauline leaves. (Bolus 8389.)



FIG. 1.

DILATRIS CORYMBOSA.



FIG. 2.



FIG. 3.

DILATRIS PILLANSII.



FIG. 4.



FIG. 5.

DIALATRIS IXOIDES.



FIG. 6.



FIG. 7.

DIALATRIS VIScosa.
PLATE XVII.



FIG. 8.